

# Organ Donation

anonymous 14 May 2014

**This document is a plea for people to consider getting "organ donor" put on their driver's license.** Please feel free to pass it on wherever you think it might do some good.

I've had "donor" on my driver's license for many years, but never thought much about it. Things changed shortly after Easter Sunday 2014. On that day, my 13-year-old granddaughter was hit by a car in a crosswalk and killed (I'll call her Mary). She was legally declared dead about 48 hours later, but the evidence showed that it was likely that she was brain-dead before reaching the hospital because of the severe trauma to her head and lungs, depriving her brain of oxygen for too long. This was confirmed 24 hours after her being admitted to the hospital when an MRI was done that showed about 85% of her brain was dead.

This event was -- by far -- the most traumatic thing I've ever gone through in my life. Any parent knows that losing a child is their biggest fear. I won't attempt to describe the grief of the family after the event -- words are insufficient to describe the strong emotions that surface at such a time. You simply can't understand it until you go through it -- and it's worse than you imagine. I wouldn't wish such grief even on an enemy.

I'm writing this a few weeks after the accident and we are all slowly healing, each in our own way. Once you go through something like this, you realize that if you can survive it, you probably can survive most anything that life throws at you.

Mary's parents made the decision to make her an organ donor (Mary was a loving and giving child and would have undoubtedly made the same decision herself). This must have been a tough decision for them to make at the worst moment of their lives. I haven't talked about it yet with my daughter other than to tell her I felt it was a very courageous decision for them to make and how proud I was of them.

At the time, I thought of how one of Mary's organs could help another family avoid going through what we were going through. A few days later I heard that Mary's heart had been transplanted into a 60-year-old woman. This made me a much stronger advocate for organ donation -- I'm now proud to think that I may follow in Mary's footsteps.

That's the emotional side of my appeal.

Here are some factual tidbits about organ donation and transplantation I've collected. It's a complex and potentially emotionally-charged topic, so if you're interested in more details, consult the references given at the end of the document. I usually round statistics to two significant figures because this helps people see the major trends and more significant figures are hardly ever required. I'll append SI prefixes to get numbers between 1 and 1000: for example, 60k is 60 thousand.

Statistics are for the US [nir and other references]. Each day:

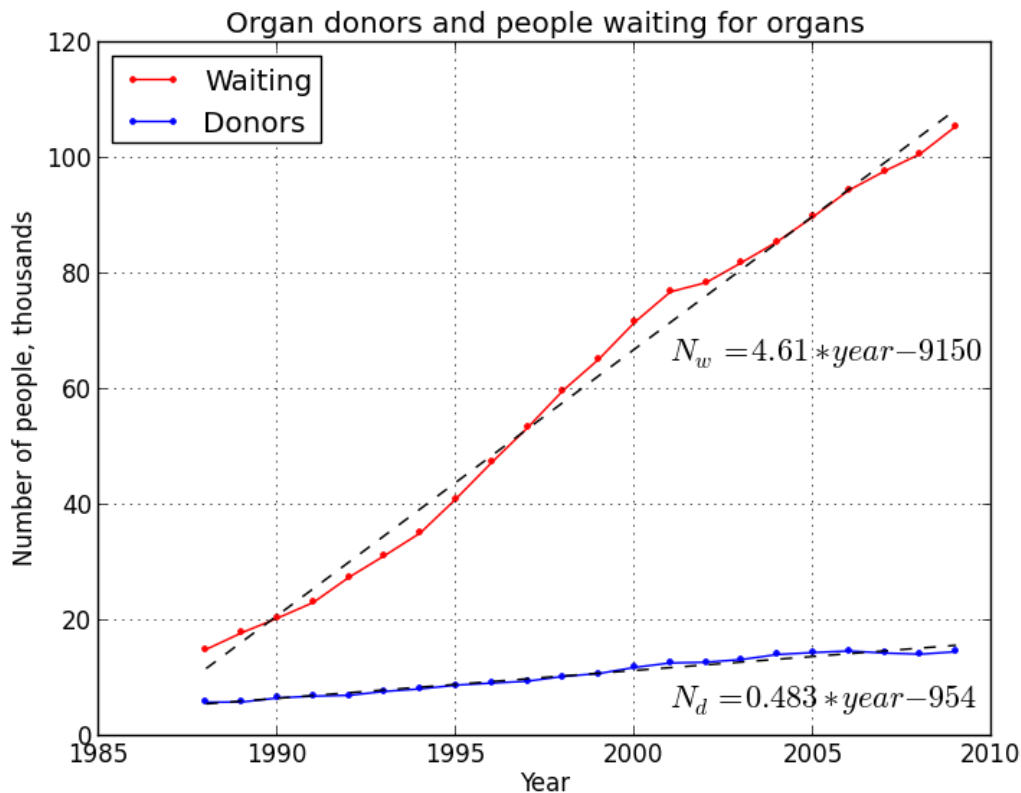
- ◆ There are about 79 organ transplants.
- ◆ 18 people die waiting for an organ.
- ◆ 144 people are added to the waiting list for organs.

122k people are currently waiting for an organ.

One organ donor can save up to around 8 or 9 lives. Tissues/organs that can be used are: corneas, middle ear, blood vessels, heart, lungs, liver, pancreas, kidneys, bones, intestines, and skin. About 2/3 of the organ transplants are kidneys and livers. Here are some transplant numbers for 2013:

Organ	Transplants Performed
All Organs	29k
Kidney	17k
Liver	4.6k
Pancreas	256
Kidney/Pancreas	762
Heart	2.5k
Lung	1.9k
Heart/Lung	23
Intestine	109

Organ transplant demand outstrips the supply (data from <http://www.organdonor.gov/about/graphdescription.html>):



Note the order-of-magnitude difference in the slopes of the fitted lines. A document like [ar] should devote a page to an executive statement about why such a large discrepancy exists and what key strategies are being used to fix it.

Some facts about organ donation:

- ♦ There is no cost to donors or their families for organ or tissue donation.
- ♦ Anyone at any age can be a donor or receive a donated organ or tissue.
- ♦ Most major religions support the concept of organ donation.
- ♦ Age of a donor isn't important -- the suitability of organs for transplant is determined at death.
- ♦ About 60% of the people receiving transplants were 50 or older [data from 2013].
- ♦ Some people waiting for organs may register at more than one transplant center, confusing the statistic of "number of persons waiting for a transplant". Still, one can't dispute the conclusion that there are a lot more recipients than available organs.

- ◆ About 1 out of 5 people over 65 years old think they are too old to donate organs. About 10% think they are too old to receive an organ. Neither thoughts are correct.
- ◆ In 2013, there were 5.9k living donors and 8.3k deceased donors. One third of these donors were over 50 years old [optr].
- ◆ The demand for kidneys is by far the largest for transplants and the gap between donors and recipients is a major problem. The number of patients waiting for kidneys grows each year, but the organ donation numbers are flat.
- ◆ Discard rates (fraction of organs discarded): pancreas 25-30%, kidney 18%, liver 10%, lungs 5%, hearts 1%. Lungs and hearts have low discard rates because a recipient is almost always selected before they are removed from the donor. [ar] "Discard" means the organ wasn't used (for whatever reasons) after being offered to the primary and numerous secondary recipients.
- ◆ The number of donated organs per donor is around 3.5 (number of donated organs divided by number of donors) [ar:181].
- ◆ About half of those patients waiting for transplants receive a transplant within 5 years of getting on the waiting list [we:10].
- ◆ Fractions of transplant patients still living after 5 years: 69% kidney, 75% heart, 74% liver, 54% lung [nir].
- ◆ 2.5 million people died in the US in 2010 [cdc]. There were 7.9k deceased organ donors in the same year [optn]. This means 0.03% of the people that died donated organs.

The US population is 318 million; about 4/5 of those are 15 years and older (gotten by visually integrating a population histogram by age). Thus, the maximum possible US organ donation population is about 250M people. More than 100M people in the US are signed up to be a donor [nir], or roughly 40% of the adults. Organ donation only is possible in cases of brain death, which make up 2% of all deaths. That means about 5M deaths that would be suitable for organ donation. If that 40% fraction applied, that means there should be approximately 2M organ donors. But the fraction was only 0.03% -- what gives? Perhaps the medical requirements for transplantation are so stringent that only a fraction of the donated organs can be used. I sent off an email to the HRSA asking this question, but got back an inane response that had nothing to do with the question I asked, so I can't resolve the discrepancy. Regardless, it's easy to get DONOR put on your driver's license. But it's hard to overstate the importance that simple little act may be to someone else's life in the future.

## References

[xx:n] means page n of reference xx.

- [ar] [http://srr.transplant.hrsa.gov/annual\\_reports/2011/pdf/2011\\_SRTR\\_ADR.pdf](http://srr.transplant.hrsa.gov/annual_reports/2011/pdf/2011_SRTR_ADR.pdf) *United States Organ Transplantation*, OPTN & SRTR Annual Data Report 2011. Accessed 10 May 2014.
- [cdc] <http://www.cdc.gov/nchs/fastats/deaths.htm> Data for 2010. Accessed 10 May 2014.
- [gb] <http://www.organdonor.gov/images/pdfs/giftoflifegeneralbrochure.pdf> A two-page introduction to organ donation. Accessed 10 May 2014.
- [optn] <http://optn.transplant.hrsa.gov> Accessed 10 May 2014. OPTN stands for Organ Procurement and Transplant Network. You can access numerous statistics related to organ donation at this site.
- [we] <http://www.unos.org/docs/WEPNK.pdf> *What Every Patient Needs to Know*, United Network for Organ Sharing, 2003.
- [nir] <http://www.organdonor.gov/about/data.html> Accessed 10 May 2014.